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Field Installation Guide

HTT Electric Catox Systems

Installation Instructions and Field Wiring Connections

Assume that we have just written 3 pages of introduction telling you how great HTT is and that we will not accept any responsibility for mistakes in installation, operation, etc. and that you are supposed to read all of the manuals for each component. This is the area that I normally skip over when I read these manuals, so I won't bore you with it. Following is the good stuff that you will need to know.



Assembly of the Unit

Place the main unit on the cement pad and bolt on the stack. The required fasteners and fittings are in boxes packaged with the control panel. The stack is bolted to the mounting flange.

The waste gas connection is the 3" fitting on the piping manifold. Connections may be PVC or other approved materials. Note diversion valves above and below the connection. These are used to tune the system when high VOC conditions are present.

The 3 phase(240/480/3/60) power is connected to the disconnect. The 1 phase (12/1/60) power is connected into the panel to the L1 and L2 terminals as shown below.

The system startup takes 30 seconds and heat up time is 15-30 minutes. The unit will shut down for high temp conditions either before or after the catalyst or for a remote input from the customers controls.

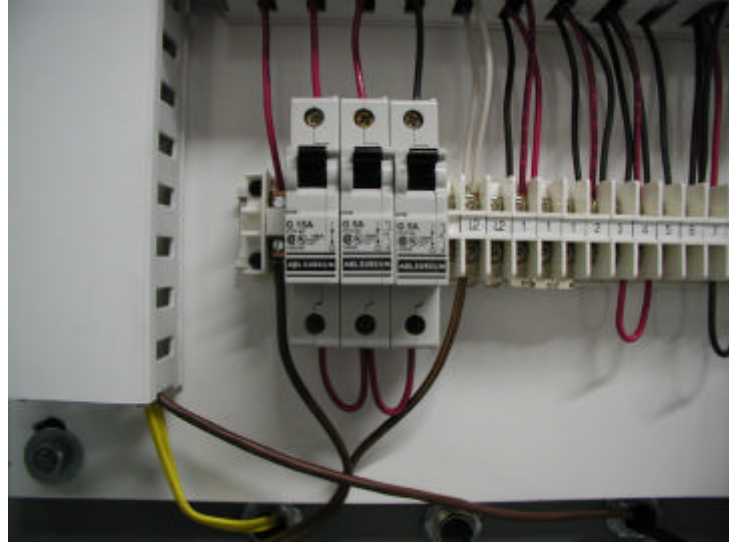
The catalyst is mounted in the stainless steel ducting within the insulated 304 SS shell. The ducting is bolted together at the factory. Ducting is easily disassembled for repair and maintenance. The stainless steel ducting components are mounted in an insulated weather-resistant 304 SS enclosure that can be easily removed for inspection and repairs on the unit in the future. The lining materials may be removed and replaced easily as shown below.



Should future replacement or maintenance be required on the unit, the cover may be removed and the catalyst accessed as shown able. The sections are bolted together with reusable woven gasket material.

Most of the waste gas heat requirement is supplied with the air to air preheat exchanger. The system also uses electric heating elements to heat the waste gases to the operating temperatures required at the inlet to the catalyst bed (500-600F). The heat input is controlled using an HDR Inc, Model ZF3 SCR to regulate the heat input using a thermocouple and a Honeywell temperature controller. This controller sends a 4-20 ma signal to the SCR to control temperature. This thermocouple is located directly next to the heating elements and controls the temperature as well acting as high temperature protection for these elements. The system is designed to operate at flow rates below the design rating because of this arrangement.

FIELD WIRING INFO



240/480/3/60 Power Feed

Qualified electrical contactors should be used to connect the 3 phase power to the panel disconnect terminals. Appropriate safety measures should be taken.

Power to HTT Main Panel

L1 120/1/60 10 Amp (On left of Circuit Breakers)

L2 Common (Neutral) (On right of Circuit Breakers)

Note: Optional 3 phase step-down transformer must be wired and tested before wiring to the main 120 volt panel connections.

Mounted Control Panels

The main control panels are mounted on the unit, or supplied loose for installation by others. If provided loose, have your electrician mount the panel close to the unit. When provided loose, a local panel is required.

Wiring the Remote Panel

The main panel may be mounted on the unit or in a remote location. Follow the wiring guide below. The 4-20 ma signal wires should be connected to the output signal connections on the terminal strip. Low fire is pilot mode.

Optional Customer Interface to Main Panel

The panel is designed to operate as a relay logic system with the capability to interface with most PLC systems. Using standard I/O logic, interface connections can be made as follows. The jumpers are removed when external contacts are connected.

Customer External Wiring

Remote Limits Input	4	---I	I---I	I---	5
Remote Heater Start Input	1	-----I	I-----		7
Remote Heater Stop Input	8	---I (NC)	I---		9
Heater Status	11	--I (CR6)	I--		12
At Temp Interlock (Open below 450F)	13	--I (CR4)	I--		14

Customers Blower Motor field Wiring

Customer is responsible for installing a starter to the optional combustion blower with an interlock to a spare contact or from a pressure switch, for remote safety limit. This contact may be wired to the "Remote Safeties" or combined with other limit contacts.

Thermocouple Field Wiring to Customers Devices

The system is complete with (2) two Duplex "K" Thermocouples. If additional inputs are required for remote monitoring or data logging, pull 1 set from each secondary T/C.

These extra contacts can be connected directly to customers chart recorders. Note: Red is (-) Note: T/C wiring must be run separate or in the Low voltage Conduit.

Free HTT Startup

HTT will supply free startup service. Not included are travel and living expenses. Make arrangements 2 weeks prior to facilitate scheduling. We strongly suggest that you DO NOT startup the system until the installation has been checked and approved by HTT personnel and that proper operator training has been given.

Adjusting the Bypass Dampers

The customer's field ducting will be connected directly to the waste gas inlet. Manual dampers located at the inlet can be field set for proper flow rate. Normal position is for 100% of the gases to be directed to the top of the heat exchanger. This allows maximum preheat efficiency. When the waste gas stream contains higher VOC levels, less preheat is required. If VOC levels are high enough (>8% LEL), no electric preheat is required. If too high, the temperature will climb above unsafe operating conditions. (1200F). This is corrected using the bypass damper located below the inlet connection to bypass the gas stream around the heat exchanger.

When the site waste gas stream contains too high a level of VOC concentration than the system can handle, the first indication will be the temperature indicator located at the catalyst outlet. As the temperature rises, the output of the primary temperature controller will drop toward 0 % output. This is good because it means that the system is using less electricity thus lower operating costs. This outlet reading should never rise above 1,000 F.

Note: HTT does not suggest operating with a waste gas stream with a VOC concentration higher than 25% LEL. Dilution air should be used and/or a larger system installed as necessary.

System Startup and Operation



Typical Startup

1. Turn "Control Power" switch to "ON", wait 15 seconds for the temperature controllers to complete their diagnostics.
2. Push the second switch "HIGH OXIDIZER TEMP", the light should stay on if the chamber temperature is below set point.
3. Push the third switch "REMOTE RESET ALARM", light should stay on if all local and remote safeties are made across terminals #4 and #5. Blower and other safeties must be on for system Burner or Electric Heater to start. The customer's blower pressure switch may be wired across this contact or started from customers source. A spare contact on the customers starter, or duct pressure switch should be used and wired across any additional safety limits. Blower should be energized long enough to purge all ducting 5 times prior to burner/heater start.
4. Electric Heater Startup - Turn the Electric Heater/Main Burner "ON" switch, (first switch in second row) to the right to "ON", this will set the startup latch circuit and display a green indicator light.

5. The system is reset by turning the “Control Power” to “OFF” and then “ON”. The “MAIN BURNER CONTROLLER” will start in Manual with the output setting at “0”. This means that no heat is called for, and the SCR will not operate. When ready, the operator will change the “MAIN BURNER CONTROLLER” to automatic by pressing the Manual/Auto button. An “A” will appear in the upper right corner of the visual display. The controller is programmed to limit the increase rate of the output of the system to come up to temperature slowly. This will prevent voltage spikes and smooth the system response. Check the operating manual for the Temp Controller for other adjustments that may be required.

Controller Display

The Honeywell UDC3000 series controllers offer options for monitoring and display. The most convenient is the Output display. This is the percentage output of the controller during operation. This is the 4-20 ma signal going to the SCR, and will directly indicate power output. To display output, press the DISPLAY button on the main temperature controller until OUTPUT appears. This readout indicates the % of output (0-100%).

High VOC Condition Indication and Response

If the output drops toward 0% and the temperature continues to climb, the by-pass valves must be opened, and/or more dilution air must be added to the stream. We have a spare 4-20 ma output in the catalyst outlet temperature controller that can be used to control a dilution air valve at the suction side of the customer's vacuum pump. Contact HTT for suggestions on how to implement these modifications.

